

WHAT IS CLAIMED IS:

1. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 1;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 1, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 2 to 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 1 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 2 to 8.

2. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 2;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 2, where one or more amino acids are deleted, substituted or added, and excreting the F_0F_1 -ATPase

activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NO: 1 and SEQ ID NO: 3 to 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 2 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NO: 1 and SEQ ID NOS: 3 to 8.

3. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 3;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 3, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the proteins having the individual amino acid sequences represented by each of SEQ ID NOS: 1 and 2 and SEQ ID NOS: 4 to 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 3 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the

amino acid sequences represented by each of SEQ ID NOS: 1 and 2 and SEQ ID NOS: 4 to 8.

4. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 4;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 4, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 3 and SEQ ID NOS: 5 to 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 4 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NO: 1 to 3 and SEQ ID NOS: 5 to 8.

5. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 5;

(b) a protein comprising a modified one of the amino acid sequence represented by SEQ ID NO: 5, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 4 and SEQ ID NOS: 6 to 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 5 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 4 and SEQ ID NOS: 6 to 8.

6. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 6;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 6, wherein one or more amino acids are deleted, substituted or added, and which can exert the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 5 and SEQ ID NOS: 7 and 8; and

(c) a protein having an amino acid sequence having 70 % or more identical to the amino acid sequence represented by SEQ ID NO: 6 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 5 and SEQ ID NOS: 7 and 8.

7. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 7;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 7, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 6 and SEQ ID NO: 8; and

(c) a protein having an amino acid sequence having 70 % or more identity to the amino acid sequence represented by SEQ ID NO: 7 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 6 and SEQ ID NO: 8.

8. A protein selected from the group consisting of the following proteins (a) to (c):

(a) a protein having the amino acid sequence represented by SEQ ID NO: 8;

(b) a protein having a modified one of the amino acid sequence represented by SEQ ID NO: 8, where one or more amino acids are deleted, substituted or added, and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 7; and

(c) a protein having an amino acid sequence having 70 % or more identity to the amino acid sequence represented by SEQ ID NO: 8 and exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins comprising the amino acid sequences represented by each of SEQ ID NOS: 1 to 7.

9. A protein complex comprising eight proteins respectively selected from the eight groups as defined by each of claims 1 to 8.

10. A DNA encoding any one of the proteins according to claims 1 to 8.

11. A DNA selected from the group consisting of the

following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO:9; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 2 to 8.

12. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO: 10; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NO: 1 and SEQ ID NOS: 3 to 8.

13. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO: 11; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when

the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 and 2 and SEQ ID NOS: 4 to 8.

14. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO:12; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the individual amino acid sequences represented by each of SEQ ID NOS: 1 to 3 and SEQ ID NOS: 5 to 8.

15. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO:13; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 4 and SEQ ID NOS: 6 to 8.

16. A DNA selected from the group consisting of the

following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO: 14; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 5 and SEQ ID NOS: 7 and 8.

17. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO: 15; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 6 and SEQ ID NO: 8.

18. A DNA selected from the group consisting of the following DNAs (a) and (b):

(a) a DNA having the nucleotide sequence represented by SEQ ID NO: 16; and

(b) a DNA hybridizing with the DNA under stringent conditions and encoding a protein exerting the F_0F_1 -ATPase activity when

the protein forms a complex with all the individual proteins having the amino acid sequences represented by each of SEQ ID NOS: 1 to 7.

19. A DNA comprising the eight DNAs respectively selected from the eight groups as defined by each of claims 11 to 18.

20. A DNA having the nucleotide sequences represented by SEQ ID NOS: 9 to 16.

21. A DNA having the nucleotide sequence represented by SEQ ID NO: 21.

22. The DNA according to any one of claims 10 to 21, where the DNA is derived from a microorganism belonging to the genus Corynebacterium.

23. The DNA according to any one of claims 10 to 21, where the DNA is derived from a microorganism of the species Corynebacterium ammoniagenes.

24. A recombinant DNA constructed by inserting the DNA according to any one of claims 10 to 18 into a vector.

25. A recombinant DNA constructed by inserting the DNA

according to any one of claims 19 to 21 into a vector.

26. A transformant obtained by transformation of a host cell with the recombinant DNA according to claim 24 or 25.

27. A transformant according to claim 26, where the host cell is a microorganism of the species Escherichia coli, Corynebacterium glutamicum or Corynebacterium ammoniagenes.

28. A method for producing a protein according to any one of claims 1 to 8, which comprises culturing a transformant obtained by transformation of a host cell with the recombinant DNA according to claim 24 in a culture medium, so as to allow the protein according to any one of claims 1 to 8 to be expressed and accumulated in the culture and harvesting the protein from the culture.

29. A method for producing a protein complex having the F_0F_1 -ATPase activity, which comprises culturing a transformant obtained by transformation of a host cell with the recombinant DNA according to claim 25 in a culture medium, so as to allow a protein complex having the F_0F_1 -ATPase activity to be expressed and accumulated in the culture and recovering the protein complex from the culture.

30. A method for producing nucleoside 5'-triphosphate, which comprises by use of a culture of a transformant obtained by transformation of a host cell with the recombinant DNA according to claim 25 or a treated product of the culture as an enzyme source, allowing the enzyme source and a precursor of nucleoside 5'-triphosphate to co-exist with each other in an aqueous medium to generate and accumulate the nucleoside 5'-triphosphate and recovering the nucleoside 5'-triphosphate from the aqueous medium.

31. The method according to claim 30, where the precursor of nucleoside 5'-triphosphate is adenine, guanine, uracil, cytosine, hypoxanthine, adenosine, guanosine, uridine, cytidine, inosine, adenosine 5'-monophosphate, guanosine 5'-monophosphate, uridine 5'-monophosphate, cytidine 5'-monophosphate or inosine 5'-monophosphate.

32. The method according to claim 30, where the nucleoside 5'-triphosphate is adenosine 5'-triphosphate, guanosine 5'-triphosphate, uridine 5'-triphosphate or cytidine 5'-triphosphate.